Aerospace Propulsion & Power Base R&T Program

Program Overview

Waldo A. Acosta
waldo.acosta@grc.nasa.gov
(216) 433-3393
John H. Glenn Research Center
Lewis Field

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NASA Enterprises-From Strategic Plan to Programs

NASA Strategic Plan

1998
NASA Policy Directive
(NPD)-1000.1

"NASA is an investment in America's future. As explorers, pioneers, and innovators, we boldly expand frontiers in air and space to inspire and serve America and to benefit the quality of life on Earth."

- Biological and Physical Research
- Earth Science
- Human Exploration and Development of Space
- Space Science
- *Aero-Space Technology*

National Goals

Goals & Objectives

Enterprise Programs

- Future-X/Pathfinder
- QAT
- AvSP
- ASC
- HPCCP
- UEET
- X-33
- SATS
- X-34
- 2nd Gen RLV

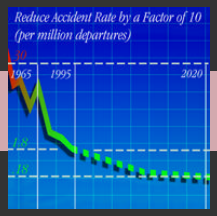
R&T Base Programs

R&T Base Programs

- Vehicle Sys. Tech.
- Aviation Ops. Sys.
- Flight Research
- Information Tech.
- *Propulsion & Power*
- Rotorcraft
- Adv. Space Trans.

Updated Enterprise Goals & Objectives

Revolutionize Aviation

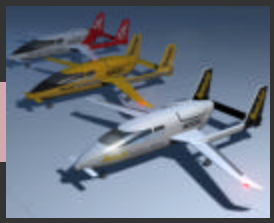


Reduce Accident Rates

Increase System Throughput

Reduce Noise

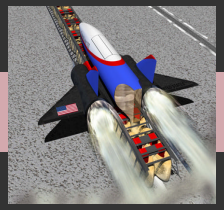
Reduce Emissions



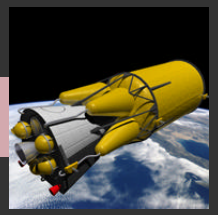
Reduce intercity & transcontinental travel time

Advanced Space Transportation

Reduce mission & crew loss

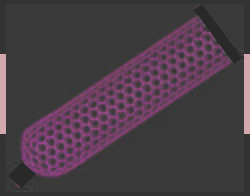


Reduce Cost



Reduce Mission Time

Pioneer Technology Innovation



Technology Innovation

Engineering Innovation

Commercialize Technology

Program Objectives

- **Meet National Goals**
  - Maintain the superiority of U.S. engines
  - Ensure the long-term environmental compatibility of engine systems
  - Improve the safety, efficiency, and cost effectiveness of the global air transportation system and Access to Space
- **Support the Aerospace Technology Enterprise Goals and Objectives**
  - Deliver break-through propulsion technologies through high-risk, high pay-off research and technology development focusing on current goals and anticipating the future beyond
  - Develop and advance multidisciplinary propulsion technologies that can form the basis for future focused programs and/or be transferred to industry and other end-users

Aerospace Propulsion & Power Base R&T Program

- Covers wide range of technologies and applications- from general aviation to access to space
- Primarily long range, high risk research but with a balance of technology readiness levels
- Support Glenn Research Center Core Competencies
  - Aeropropulsion Systems
  - Aerospace Power & Electric Propulsion
  - Aerospace Communications
  - Fluids and Combustion

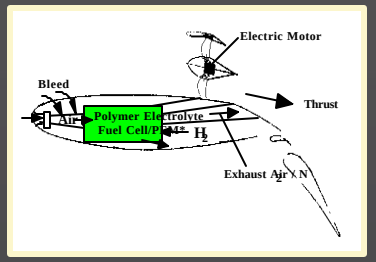
NASA's Technology Readiness Level (TRL) Scale

	TRL	General NASA Definition
System Test/Ops.	9	Flight system proven on operational flight
	8	Flight system qualified by demonstration
System Develop.	7	Prototype validated in flight environ.
Tech. Demo.	6	Prototype validated in relevant environ.
	5	Component verified in a relevant environ.
Technology Dev.	4	Component tested in laboratory
	3	Proof-of-concept for critical characteristics
Feasibility Check	2	Technology Concept formulated
Tech. Research	1	Principles observed & reported

Projects in the Aerospace Propulsion & Power Program

Revolutionize Aviation

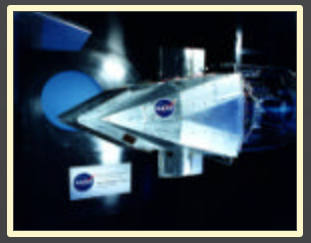
Zero CO2 Emission Technologies



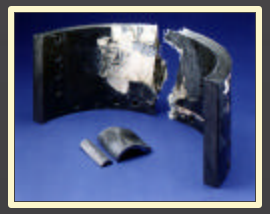
Smart Efficient Components

Oil-Free Turbine Engine Technology

Supersonic Propulsion



Ultra Safe Engine Technologies

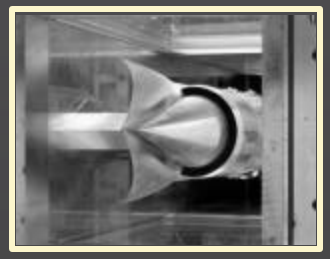


Higher Operating Temp Propulsion Components

Fundamental Noise

Projects in the Aerospace Propulsion & Power Program

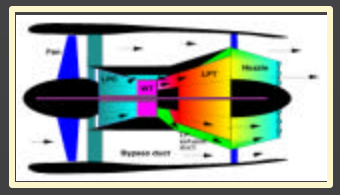
Advanced Space Transportation



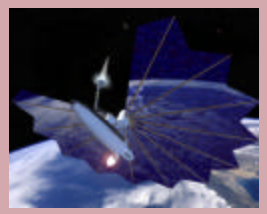
Combined Cycle Propulsion

3rd Generation Propulsion Research & Technology

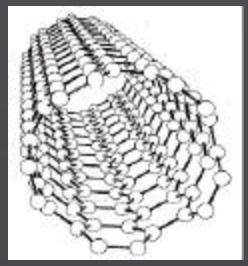
Pulse Detonation Engine Technology



Projects in the Aerospace Propulsion & Power Program



Pioneer Technology Innovation



Nanotechnology

Revolutionary Aeropropulsion Concepts

Revolutionary Aerospace Propulsion Technology NRA

Potential Research Areas:

- Revolutionary and innovative concepts for new or improved aerospace propulsion systems or propulsion system components.
- Greater component and cycle efficiency; lower gaseous and particulate emissions, reduced coolant penalties, reduced noise levels, and reduced weight materials and structures.
- Innovative concepts for the analysis, design, and measurement technology.
- New and emerging technologies, like nanotechnology and biotechnology.

Revolutionary Aerospace Propulsion Technology NRA

Targeted Release Date:

December 2000

Total Amount Available for Awards:

$3.0M - $4.0 M

Number of Awards Contemplated:

30 - 40 Grants and Cooperative Agreements

NASA Research Announcement (NRA) Process